

# Sam Laing

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## PERSONAL STATEMENT

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I am pursuing a Master's degree in machine learning at the University of Tuebingen. I hold a Bachelor's degree in Mathematics from Trinity College Dublin. My background in mathematics equips me with a rigorous analytical approach, which I actively apply in my role as a part-time Machine Learning Engineer at a prominent Irish financial software company. In my professional role, I contribute to data-driven solutions and model deployment within the financial sector, gaining hands-on experience that complements my academic pursuits. I am passionate about leveraging advanced machine learning techniques to solve complex, real-world problems, and I am eager to continue expanding my technical skills and industry knowledge as I advance in the field.

## SKILLS

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**Languages:** Python, C++, SQL, , R, L<sup>A</sup>T<sub>E</sub>X, Prolog,

**Technologies:** PyTorch, JAX, Pandas, FastAPI, Azure, SLURM, GraphX, WandB, Numpy, Plotly, CUDA

**Techniques:** CNN, RNN, Transformers, XGBoost, Random Forrest Models, Hypothesis Testing, GLMs, Gaussian Processes, Markov Chains, Deep Q-learning, Imitation Learning, SNGP, DUQ

## EXPERIENCE

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### SoftCo

Dublin, Ireland

*Machine Learning Engineer*

*May 2023 – Present, Part-time*

*Business Analyst Intern*

*May 2022 - September 2022*

- SoftCo develops Purchase to Pay (P2P) financial automation software. This involves matching invoice line level data with purchase order and associated logistics data. I joined a team to provide skills on machine learning and I built a Bayesian module to automate and increase the matching rates. I achieved in excess of 90% touchless processing. SoftCo was able to take customer raw data and prove they could deliver in excess of 90% auto match as part of the sales process. This had a positive impact on sales as SoftCo won a greater number of new customers at a higher invoice volume. The customer achieved significant cost savings as they only had to process the exceptions
- Developed and deployed a Random Forrest model for multi-label classification task with a large number of classes
- Developed a JSON file parser and contributed to the construction of an Azure data pipeline.
- Developed a number of forecasting models to predict customer activity and revenue
- Communicated frequently with Software Engineers through the Agile Scrum Framework
- Compiled supporting documentation on machine learning models

### University Of Tuebingen

Tuebingen, Germany

*Research Intern*

*May 2024 - September 2024*

- Conducted research into the utility of soft label datasets for bulding better calibrated deep networks.
- In particular investigated their utility in comparison to using regularization techniques like MixUp, Manifold Mixup, CutMix and Dropout when using distance aware networks like SNGP, DUQ and Mahalanobis Distance.

### Trinity College

Dublin, Ireland

*Bachelor's Thesis*

*Sep 2021 - May 2022*

- Wrote Bachelor's thesis under the supervision of Dr Jack Kelly in which I applied category theoretical techniques (in particular simplicial homotopy theory) to prove several fundamental theorems of algebraic topology.

### Trinity College

Dublin, Ireland

*Undergraduate Researcher*

*Jun 2020 – Aug 2020*

- Conducted research into the Classification of Finite Rings using techniques in commutative algebra and category theory under the supervision of Professor Nicolas Mascot .

### Trinity College

Dublin, Ireland

*Teaching Assistant*

*Sep 2021 – Dec 2021 and Sep 2022 - December 2022*

- Corrected assignments for the advanced Engineering Mathematics course offered at Trinity College Dublin. The topics included Fourier Analysis, Partial Differential Equations and Linear Programming.

## EDUCATION

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### University of Tuebingen

Germany

*MSc. in Machine Learning; **Current Grade Average: 1.4 (equivalent 3.8 GPA USA)***

*Oct 2022 – Present*

**Relevant coursework:** Deep Learning, Statistical Machine Learning, Probabilistic Machine Learning, Trustworthy Machine learning, Time Series Analysis, Self Driving Cars, Massively Parallel Computing (CUDA Programming), Information Theory

### Trinity College Dublin

Ireland

*BA Mathematics; **First Class Honors***

*Sep 2018 – Jun 2022*

## AWARDS & ACHIEVEMENTS

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**Trinity College Academic Gold Medal:** Awarded to graduating students who achieved over a certain grade point average throughout the four year degree.

**Trinity College Entrance Exhibition Prize:** Awarded to incoming students who achieved over certain points in the entrance examinations (CAO points)

**William Hasslett Memorial Prize:** Awarded to the St Andrew's College student with the best high school grades and attending Trinity College (in the Leaving Certificate Examinations) (2017)

**University of California, Berkeley:** Was awarded an academic scholarship to Berkeley for an exchange year. Was unable to attend due to the covid pandemic

## HOBBIES & INTERESTS

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Jazz Guitar & Piano, Olympic Weightlifting, Road Cycling, Chess, 8-Ball Pool, Spikeball, Beach Volleyball

## REFERENCES

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Susan Spence, Co-founder SoftCo & Manverton.

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